REMARKS

After entry of this amendment, claims 1-100 are pending, of which claims 10-11 and 36-39 are withdrawn. Claim 72 has been amended without disclaimer or prejudice to correct an obvious typographical error. No new matter has been added.

The specification has been amended to add the heading and associated paragraph referencing the related applications already of record, headings, and a Brief Description of the Figures. Support for the Brief Description of the Drawings can be found in the Figures and figure captions on the drawing sheets as originally filed. Further support for the caption for Figure 10 can be found in the specification at page 129, lines 26-46. Further support for the caption for Figure 11 can be found in the specification at page 131, lines 4-17. Further support for the caption for Figure 37 can be found in the specification at page 177, lines 5-32. Sequence identifiers corresponding to the sequences found in Figures 3 and 4 have been added to the figure captions of Figures 3 and 4. Support for the sequence identifiers can be found in the Sequence Listing as originally filed and in the specification at page 6 for sequence X86782 and in Example 1 at pages 113-114 for KETO2. No new matter has been added.

Objections To The Specification

The specification has been amended to add headings, a Brief Description of the Drawings, and sequence identifiers for the sequences found in Figures 3 and 4. In light of the amendments, the objection is believed to be rendered moot. Reconsideration and withdrawal of the objections to the specification are respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 1-9, 12-35, 60-78, and 80-100 were rejected under 35 U.S.C. § 103(a) as being obvious over Mann *et al.* (Biotechnology, 2000; hereinafter "Mann") in view of Schewmaker *et al.* (WO 99/07867, 1999; hereinafter "Schewmaker") and in further view of U.S. Patent application publication 2004/0176570, Sandmann *et al.* (Archives and Biophysics, 2001; hereinafter "Sandmann"), and applicants' specification. Applicants respectfully traverse and request reconsideration in view of the following remarks.

To support a *prima facie* conclusion of obviousness, the prior art must disclose or suggest all the limitations of the claimed invention. See *In re Lowry*, 32 F.3d 1579, 1582 (Fed. Cir. 1994).

Mann discloses the production of astaxathin in the ***nectaries*** of tobacco flowers by expressing the *CrtO* ketolase of the green alga *Haematococcus pluvialis*. The present claims as represented by claim 1 are directed to genetically modified plants which show modified ketolase activity in ***petals*** in comparison to wild type plants. Nectaries are specialized glands which produce nectar and are quite distinct from petals which are modified leaves often conspicuous to attract pollinators. Mann clearly demonstrated by the red color of the nectaries of transgenic plants that carotenoids which included astaxanthin accumulated in the ***nectaries*** of transgenic plants and that the color of the leaves was unchanged between wild type and transgenic plants (see Mann, page 890, left column, second paragraph). Thus, Mann does not teach or suggest targeting expression of carotenoids to ***petals*** as required by the present claims.

The other references cited by the Examiner do not remedy the deficiency of the disclosure of Mann. Schewmaker discloses carotenoids production in plant seeds. US 2004/0176570 discloses carotenoid production in bacteria, *i.e., E. coli*, and does not teach or suggest targeting expression of carotenoids to ***petals*** of plants as required by the present claims. As acknowledged by the Examiner, Sandmann teaches increased carotenoid formation in yeast. Neither Schewmaker, US 2004/0176570, or Sandmann teach or suggest targeting expression to ***petals*** of plants as required by the present claims.

The Examiner also alleges that production of astaxanthin and canthaxanthin in petals of transgenic plants was possible as taught by Mann's teaching of petal specific expression of GUS using the tomato PDS promoter and chromoplast transit peptide, that heterologous expression of the *CrtO* gene and production of astaxanthin and canthaxathin in tobacco floral nectaries using a construct comprising the tomato PDS promoter and chromoplast transit peptide fused to the *CrtO* gene would apply to the commercially attractive plant Marigold as taught by Mann (see Office Action, page 5, lines 7-13). Applicants respectfully disagree with the Examiner's characterization. Mann rather discloses that using the same promoter as used for expressing

GUS in various tissues including petals but for expressing a heterologous *CrtO* gene (see Mann page 890, left column, lines 1-5), expression of carotenoids was targeted to ***nectaries*** of the transgenic plant, not to leaves and not to ***petals***. The Examiner further alleged that there is a reasonable expectation of success of producing astaxanthin in petals of transformed plants based on the teaching of Mann. However, contrary to the Examiner's assertion, there is no reasonable expectation of success since Mann demonstrated that using the same promoter and transit peptide for expression of the heterologous *CrtO* gene as used with the GUS expression experiment, rather directed expression to the ***nectaries,*** not to leaves and ***not to petals***.

The Examiner also alleges that Mann "states that the production of astaxanthin in the carotenoid flower petals of marigold is an attractive source for the commercial production of astaxanthin, a keto-carotenoid" citing to page 890 columnn 2 last paragraph to page 891 line 2 (see Office Action, page 3, lines 15-18), and that the teaching of Mann would apply to the commercially attractive plant Marigold (see Office Action, page 5, lines 12-13). Applicants respectfully disagree with the Examiner's conclusion.

References relied upon to support an obviousness rejection must provide an enabling disclosure, *i.e.*, they must place the claimed invention in the possession of the public. *In re Payne*, 606 F.2d 303, 314 (CCPA 1979) (citing *In re Brown*, 329 F.2d 1006, 1011 (CCPA 1964). An invention is not "possessed" by the public absent some known or obvious way to make it. *In re Hoeksema*, 399 F.2d 209, 274 (CCPA 1968). A presumption of obviousness is rebutted where the prior art does not disclose or render obvious a method for making the invention. *Id.*

Mann rather states "[c]onverting flower carotenoids in *Tagetes* to astaxanthin by metabolic engineering could provide an abundant source for this pigment." First this does not state "flower ***petals***." Furthermore, Mann has not taught that the carotenoids in *Tagetes* could be converted to astaxanthin, has not taught a transgenic *Tagetes*, or that the use of the tomato *PDS* promoter and chromoplast transit peptide in a transgenic plant could target expression of carotenoids to petals. The other references cited by the Examiner, as explained above, do not remedy the deficiencies of the disclosure of Mann. Since Mann and the other references cited by the Examiner have not taught targeted expression of carotenoids in ***petals*** of a transgenic plant,

Mann and the other references cited by the Examiner have not disclosed a method of making the invention, and as such do not render obvious the present claims for this additional reason.

In summary, because none of the references cited by the Examiner disclose or suggest all the limitations of the present claims, the Examiner has not met his burden of establishing a *prima facie* case of obviousness. Thus Mann, Schewmaker, US 2004/0176570, and Sandmann, alone or in combination, do not render the claims obvious. Reconsideration and withdrawal of the rejection is respectfully requested.

CONCLUSION

For at least the above reasons, Applicants respectfully request withdrawal of the rejections and allowance of the claims. If any outstanding issues remain, the Examiner is invited to telephone the undersigned at the number given below.

Applicants thank the Examiner for indicating that claim 79 would be allowable if written in independent form.

Accompanying this response is a petition for a three-month extension of time to and including February 27, 2008 to respond to the Office Action mailed August 27, 2007 with the required fee authorization. No further fee is believed due. However, if an additional fee is due, the Director is authorized to charge our Deposit Account No. 03-2775, under Order No. 13173-00007-US from which the undersigned is authorized to draw.

Respectfully submitted,

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